(12) UK Patent Application (19) GB (11) 2 178 696 A

(43) Application published 18 Feb 1987

(21) Application No 8619197

(22) Date of filing 6 Aug 1986

(30) Priority data
(31) 762989 (32) 6 Aug 1985 (33) US

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(51) INT CL⁴
G07B 17/04

(52) Domestic classification (Edition I):
B6C 104 1200 1210 1211 1250 1260 1270 1271 WQ
U1S 2133 2213 B6C

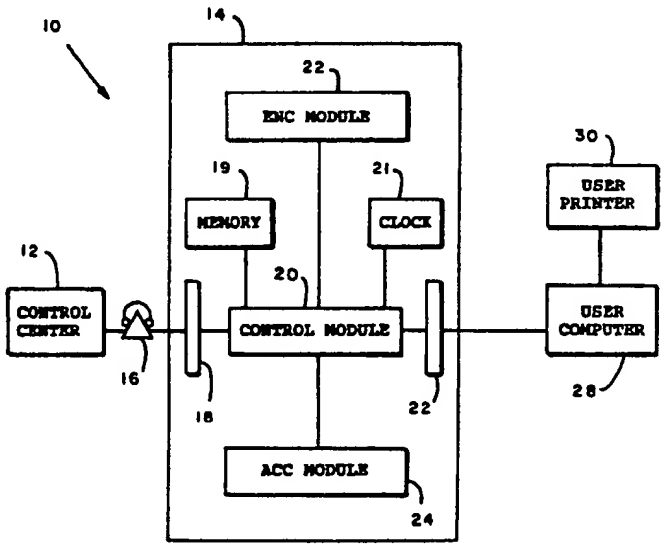
(56) Documents cited
GB A 2066736 GB 1539448 EP A2 0096386
GB A 2060228 GB 1508623 EP A2 0008737
GB A 2030748

(58) Field of search
B6C
G4A
G4H
Selected US specifications from IPC sub-classes G07B
G06F

(54) Postage metering locking system

(57) A postage metering lock-out security system is disclosed for use with electronic postage meters and for use with a postage metering system that operates in conjunction with a users computer 28 and printer 30 that prints postal value. With the lock out security system, in order for postage to be printed, the postage-metering control unit 14 must receive a valid signal or password. The password may also be used to identify a particular user for accounting purposes. The metering system can also be provided with an internal clock so that metering may take place only within circumscribed times. An additional security feature is provided by an automatic call-back for postage recharging from a remote data centre 12 in order to assure that the meter is physically located at the appropriate location.

FIG.1



GB 2 178 696 A

The drawing(s) originally filed was/were informal and the print here reproduced is taken from a later filed formal copy.

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FIG.1

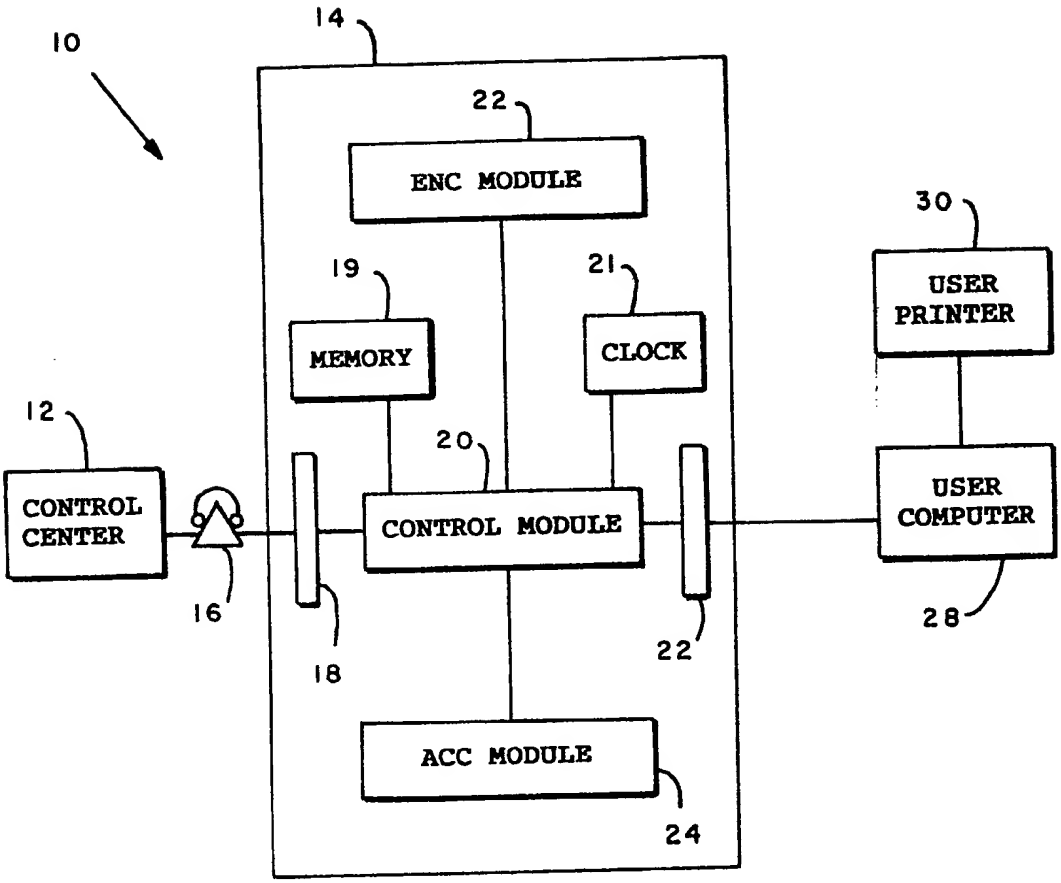
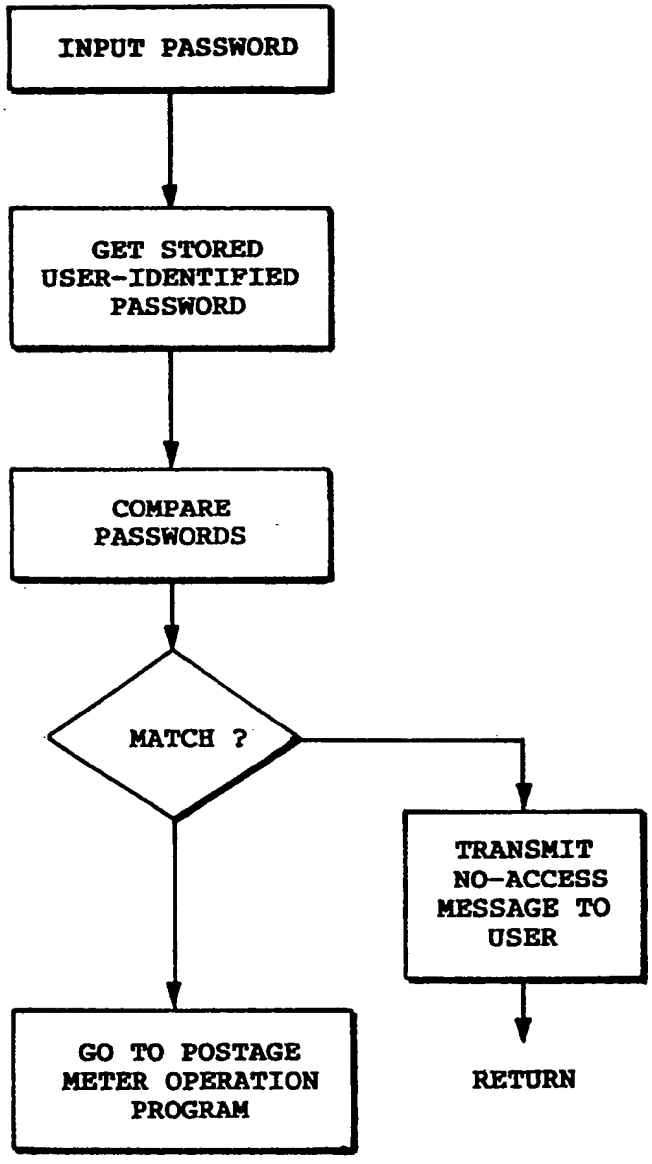


FIG. 2


INPUT PASSWORD
GET STORED USER-IDENTIFIED PASSWORD
COMPARE PASSWORDS
MATCH ?
TRANSMIT NO-ACCESS MESSAGE TO USER
RETURN
GO TO POSTAGE METER OPERATION PROGRAM

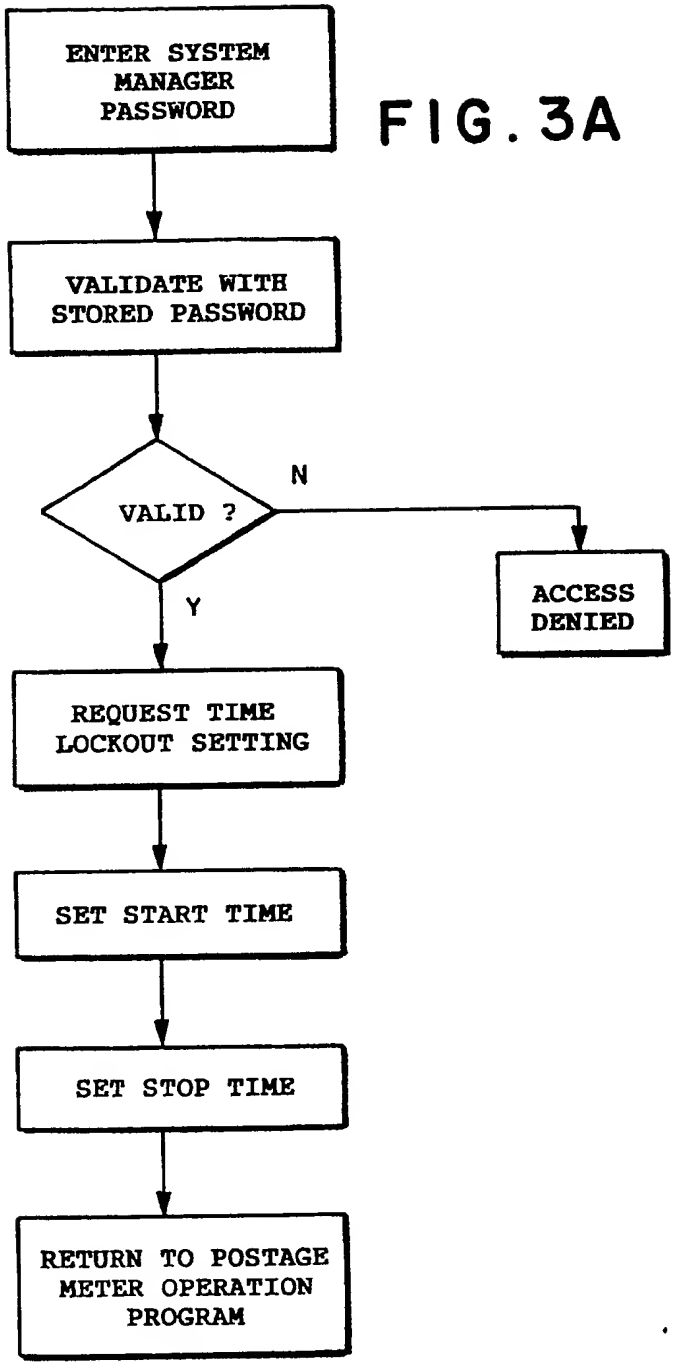

ENTER SYSTEM MANAGER PASSWORD
VALIDATE WITH STORED PASSWORD
VALID ?
N
Y
ACCESS DENIED
REQUEST TIME LOCKOUT SETTING
SET START TIME
SET STOP TIME
RETURN TO POSTAGE METER OPERATION PROGRAM

FIG. 3A

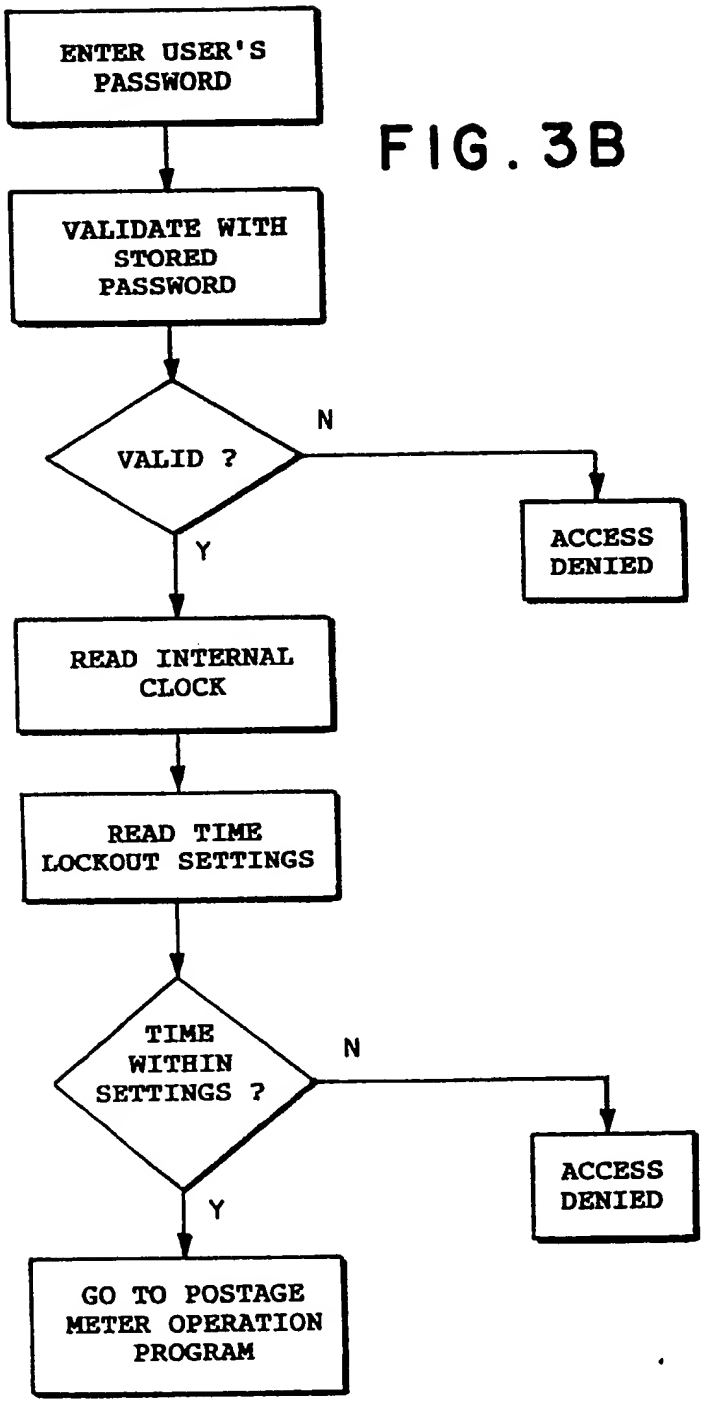

ENTER USER'S PASSWORD
VALIDATE WITH STORED PASSWORD
VALID ?
N
Y
ACCESS DENIED
READ INTERNAL CLOCK
READ TIME LOCKOUT SETTINGS
TIME WITHIN SETTINGS ?
N
Y
ACCESS DENIED
GO TO POSTAGE METER OPERATION PROGRAM

FIG. 3B

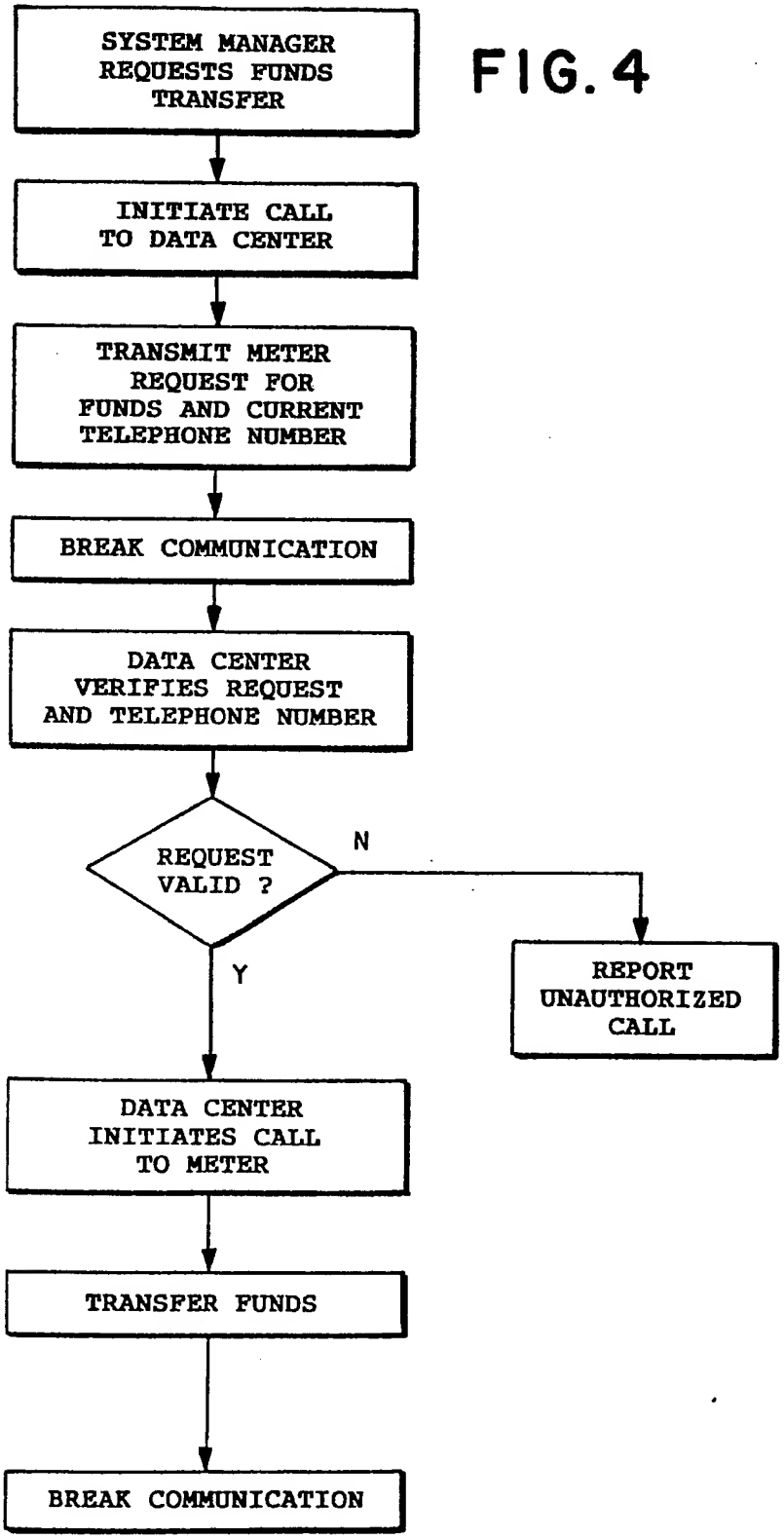

SYSTEM MANAGER REQUESTS FUNDS TRANSFER
INITIATE CALL TO DATA CENTER
TRANSMIT METER REQUEST FOR FUNDS AND CURRENT TELEPHONE NUMBER
BREAK COMMUNICATION
DATA CENTER VERIFIES REQUEST AND TELEPHONE NUMBER
REQUEST VALID ?
N
Y
REPORT UNAUTHORIZED CALL
DATA CENTER INITIATES CALL TO METER
TRANSFER FUNDS
BREAK COMMUNICATION

FIG. 4

SPECIFICATION

Postage metering locking system

The invention relates to electronic postage meters and to electronic postage metering accounting units designed for operation in conjunction with a user's computer and printer. As used herein the term electronic postage meter also refers to other similar meters, such as parcel registers and tax meters, which dispense and account for value.

Electronic postage meters are known and described for example in U.K. Patent No. 1 492 704. Electronic postage meters which utilize the customer's computer and printer are described for example, in our copending U.K. Patent Application Nos. 8609189 and 8609030.

In postage meters, the need for security is absolute. The reason for the absolute security requirement is that a postage meter is printing value, and unless security measures are taken, one would be able to print unauthorized postage, thereby defrauding the U.S. Postal Service. Most of the security measures taken are of a physical nature, but recently there have been suggestions for use of encryption to ensure that a postage indicia is valid.

In these meters, however, the security efforts have been directed mainly to preventing fraud on the Postal Service. There has been no consistent attempt to provide security for the customer who is authorized to use the postage meter to enable him to prevent unauthorized access for the use of the postage meter except by use of a lock and key to turn on the meter. Typically anyone who has physical access to the operating postage meter can meter postage for personal or unauthorized use at the expense of the authorized customer who has paid for the postage.

According to one aspect of this invention there is provided a postage metering system including security means operative to enable the metering of postage value only upon the occurrence of predetermined user-settable conditions. Preferably the security means comprises timing means for enabling the metering of postage only during a predetermined time interval. Alternatively or additonally the security means may require a user-identifying signal to enable the metering of postage. Preferably the security means includes means for enabling the metering of postage only upon the input of a user-identifying signal. The user-identifying signal may conveniently be a password.

Preferably the system further comprises a control centre operative to provide postage meter recharging of postage funds by telephone communication and the security means allows recharging only by telephone connection originating from the control centre.

According to another aspect of the invention there is provided a method for providing security for the operations of a postage meter comprising the steps of:

(a) storing a user-identifying signal in a security module of a postage meter;

(b) inputting an identifying signal to the postage meter for enabling metering operations thereof;

(c) comparing said identifying signal with said user-identifying signal; and

(d) enabling postage metering operation if said identifying sifnal matches said user-identifying signal.

Preferably the above method further comprises the steps of:

(a) setting a start time limit and a stop time limit in the security module; and

(b) providing the time of inputting of said identifying signal to said postage meter;

(c) comparing the time of inputting to the start and stop time limits previously set and enabling the meter operation if the time is in the interval between the limits.

Conveniently, said method further comprises the steps of:

(a) storing a second user-identifying signal in said security module;

(b) inputting an identifying signal to said postage meter;

(c) comparing said identifying signal with said second user-identifying signal; and

(d) enabling the setting of meter operating limits only when said identifying signal matches said second-user-identifying signal.

According to another aspect of this invention there is provided a method for providing security for the operation of a postage meter comprising the steps of:

(a) setting a start time and stop time limit in a security module of a postage meter;

(b) inputting an identifying signal to the postage meter;

(c) providing a time signal in correspondence to the time of said inputting of the identifying signal;

(d) comparing said time signal with time limits and enabling the meter if the time is in the interval between the limits.

According to another aspect of this invention there is provided a method for securing and recharging of funds to a postage meter comprising the steps of:

(a) providing a user-identifying signal for enabling access to a meter-funds recharging program in a postage meter;

(b) inputting an identifying signal to the postage meter; and

(c) comparing said identifying signal with said user-identifying signal and if there is a match, enabling the meter funds recharging program. This method may further comprise the steps of:

(a) initiating communication to a control centre for recharging funds said communication providing meter information, including the number for reestablishing communication

with the postage meter;

(b) breaking the communications; and

(c) initiating communication from the control centre to the postage meter in order to enable a funds transfer.

Further features and advantages of the method and apparatus in accordance with the invention will become more apparent from the following description, which is by way of example only, reference being made to the accompanying drawings, in which:-

Figure 1 shows a block diagram of a system which incorporates the instant invention,

Figure 2 is a flow chart illustrating a method in accordance with the invention of enabling access to the electronic postage meter,

Figures 3A and 3B comprise flow charts illustrating another method of enabling access; and

Figure 4 is a flow chart illustrating the call back method of meter recharging in accordance with the invention.

Referring generally to the system illustrated, in one embodiment, to alleviate the lack of security for the mail user, a security means is provided to lockout postage meter operation unless it is enabled by the use of a particular word or identifying signal and/or only during particular preselected time intervals to enable the customer to prevent unauthorized access to the electronic postage meter funds. In a further embodiment, the funding of the meter is enabled only upon the communication being initiated by a control centre in order to assure that funds transferred from the control centre are transferred at the behest of the actual authorized user of the meter at his physical location. For best results, only one person at a facility will be able to request the transfer of funds and to select the access words and times of use.

Referring now to the Figures, in Fig. 1, a postage and mailing information applying system which may practice the present invention is shown generally at 10 and includes a control centre 12 and an accounting unit 14 that are in communication with one another through a communicating device such as a telephone 16, facsimile machine, telex machine, or the like.

Located within the accounting unit 14 is a modem 18 or converter 18 which communicates with the telephone 16 and a control module 20 of the accounting unit, which control module may be a CPU processor such as an Intel 8081, available from Intel, Santa Clara, California, operating under a suitable control program. The control module includes a ROM 19 either integral or in connection therewith (as shown) in which the control program resides. In communication with the control module 20 is an encryption module 22 as will as an accounting module 24. A suitable encryption module is described in U.K. Patent Application No. 8609030. The accounting module 24 includes a random access memory that incorporates the ascending and descending registers. The RAM may be of the CMOS type including a battery-backup so that the register data may be retained or the accounting module may incorporate a non volatile memory for permanent memory and further control to enable transfer of accounting data to permanent memory registers as is well known in the art.

As is known in postage meters, the ascending register is the register that records the amount of postage that is dispensed or printed on each transaction and the descending register is that which records the value or amount of postage that may be dispensed and decreases from that amount as postage is printed. Another modem 26 within the accounting unit 14 provides communication between the control module 20 and a user computer 28. It will be appreciated that such modem 20 may be replaced by direct communication between the computer 28 and the accounting unit 14 through parallel or serial input/output buffers or the like. It will be further understood that the modem 18 is optional and communication may be established through the user computer or by physically carrying the accounting unit 14 to the control center 12.

The user computer may be any type of computer that has input/output, logic, and memory as, for example, a personal computer such as the IBM AT available from IBM, Armonk, New York. Connected to the user computer 28 is a printer 30. The printer may be of any type that is capable of printing individual alpha numerics and bar code.

While this embodiment of the invention is described with respect to the foregoing illustrated system, it will be understood that the invention may also be incorporated in a conventional electronic postage meter having an integral printer.

In the block diagram shown in Fig. 1, the control center 12, which may be a Post Office or other data center such as employed in remote meter recharging operations as taught, for instance, in U.K. Patent Nos. 1 520 529 and 1 520 530 incorporated herein by reference, is a source of postage value. The postage meter may be charged remotely upon a customer number being provided to the Postal Service. The Postal Service or data center, in turn, will provide postage value that is automatically input to the customer's postage meter, or in this case the accounting unit 14. In the system of Fig. 1, the accounting unit 14 is a secure unit such that tampering by physical, electronic or magnetic means in inhibited. Security features such as shielding, break-away bolts and the like are well known and the means for securing the accounting unit will not be described.

As detailed below in accordance with the

invention the accounting unit 14 is accessible by the user computer only upon a proper code or password being received by the control module 20 of this accounting unit 14 from the user computer 28. As brought out in the copending application No. 8609030., previously referenced, postage to be printed by the printer 30 includes an encrypted string that is generated by the encryption module 22. Such encryption may be based upon any recognized code such as DES or RSA. Upon the appropriate information being supplied to the accounting unit 14 the encryption module 22 would generate an encrypted string to be printed upon a label or mailpiece. This supplied information could include a transaction number, the customer, the value of postage and the like. It will be appreciated that in conventional electronic postage meters, there is no encryption module.

In accordance with this embodiment of the invention, a security module 32 which conveniently may be conventional EPROM having a program residing therein accessed by the microprocessor of the control module 20 is provided to allow the owner and authorized users to enable the printing of postage and to prevent all others from fraudulent use of the meter portion 14. It will be understood that the security module may, of course, reside as an integral part of the control module 20, the encryption module 22, or the ACC module 24. It will be further appreciated that the security program module may suitably be a resident part of the microprocessor control program of a conventional electronic postage meter which is accessed by the microprocessor. It is further contemplated that the security module 32 may have its own microprocessor operation for communicating in known manner with the control module 20.

Referring now to Fig. 2, there is shown a flow chart of a way of implementing authorized-user-only access to the meter. The term user as defined herein is a customer of one designated by the customer, i.e. someone other than a service person, meter manufacturer, or data center representative. As illustrated in the flow chart, in order to enable the printing of postage a user identifying signal is provided. The user keys in a user-generated password from computer 28 through modem 26 (or from the keyboard of the electronic postage meter) which password is compared with a word previously stored in the security module. If there is a match, the program returns control to the control module to continue metering operation. If there is no match, the program will not enable the encryption module and will inform the user's computer via the modem 26 that an invalid code has been entered. In a conventional electronic postage meter, the integral printer may be inhibited from imprinting the indicia. It will be understood that the user's password may be communicated to the security module by means of a magnetic tape reader, card reader, or bar code reader instead of the user's keying the password through the keyboard. It will be appreciated that more than one password could be required if desired and that the user's password could be encrypted as part of the encrypted string to enable the particular user to be identified. The user's password will also enable the computer and/or meter portion to keep track of a particular user's postage usage for accounting purposes.

As shown in the flow charts of Figs. 3A and 3B, the authorized meter user may also set time-of-day limits on the use of the meter to prevent, for example, after work-hours access to the meter. Preferably, a user-identifying password known only to one person described herein as the System Manager will enable access to the time limit selection program shown in the flow chart of Fig. 3a. It will be appreciated that while less desirable from a security standpoint, if desired, any user may be given the system manager password to allow the user to change the preset time limits. It will be understood that the System manager is not limited to simply setting the time limits. It is also contemplated that the System Manager's access password may encompass further user setting functions such as setting of fund authorization limits for a given user password, for example, or for setting the time limits for the use of a particular user identifying password to enable better user control and accounting for the printing of postage or for changing the user's password.

The flow chart of Fig. 3A is essentially self-explanatory. The system manager enters his identifying password (code) to enter the setting program. The start and stop time limits are inserted and the program returns to the normal operation operation program. Other limits may be accessed and set in a similar manner to that shown in Fig. 3A for the time limits.

As shown in Fig. 3B, another user logs onto the meter by inputting his password as described with respect to Fig. 2. The program then compares the time of day which is obtained from internal clock 21 shown in Fig. 1 with the preselected limits stored in the security module to determine whether the meter access is within the appropriate time limits. If it is the meter program control proceeds to normal operation. Thus meter operation is enabled only at times between the preset limits.

The flow chart of Fig. 4 shows a further security feature in recharging the funds of the meter. The authorized user, again preferably only one individual, the System Manager who has knowledge of the appropiate password to gain access to the funds transfer program, initiates a transfer funds request. In accordance with the invention, once entered the meter or accounting unit 14 initiates a phone call to the

control center 12 through the device 16. The control center is then furnished with any desired meter identifying information including the meter's current telephone number. The communication connection is then broken.

The control center 12 then initiates a communication to the accounting unit 14, verifies the request and phone number of the meter. The information is compared with that stored in the security module to determine whether the request is a valid request. If the request is deterimined to be a valid request then the fund transfer operation is performed in conventional manner as described, for instance, in U.K. Patent Nos. 1 520 529 and 1 520 530.

If the request is determined to be invalid, the control center 12 receives a signal indicative that there was an unauthorized request for funds transfer and the unauthorized call is reported.

CLAIMS

1. A postage metering system including security means operative to enable the metering of postage value only upon the occurrence of predetermined user-settable conditions.

2. A system according to claim 1 wherein the security means comprises timing means for enabling the metering of postage only during a predetermined time interval.

3. A system according to claim 1 or claim 2 wherein the security means requires a user-identifying signal to enable the metering of postage.

4. A system according to claim 1 or claim 2 wherein the security means includes means for enabling the metering of postage only upon the input of a user-identifying signal.

5. A system according to claim 3 or claim 4 wherein the user-identifying signal is a password.

6. A system according to any of the preceding claims wherein the system further comprises a control centre operative to provide postage meter recharging of postage funds by telephone communication and wherein the security means allows recharging only by telephone connection originating from the control centre.

7. A method for providing security for the operations of a postage meter comprising the steps of:

(a) storing a user-identifying in a security module of a postage meter;

(b) inputting an identifying signal to the postage meter for enabling metering operations thereof;

(c) comparing said identifying signal with said user-identifying signal; and

(d) enabling postage metering operation if said identifying signal matches said user-identifying signal.

8. A method according to claim 7 and further comprising the steps of:

(a) setting a start time limit and a stop time limit in the security module; and

(b) providing the time of inputting of said identifying signal to said postage meter;

(c) comparing the time of inputting to the start and stop time limits previously set and enabling the meter operation if the time is in the interval between the limits.

9. A method according to claim 7 or claim 8, further comprising the steps of:

(a) storing a second user-identifying signal in said security module;

(b) inputting an identifying signal to said postage meter;

(c) comparing said identifying signal with said second user-identifying signal; and

(d) enabling the setting of meter operating limits only when said identifying signal matches said second-user-identifying signal.

10. A method for providing security for the operation of a postage meter comprising the steps of:

(a) setting a start time and stop time limit in a security module of a postage meter;

(b) inputting an identifying signal to the postage meter;

(c) providing a time signal in correspondence to the time of said inputting of the identifying signal;

(d) comparing said time signal with time limits and enabling the meter if the time is in the interval between the limits.

11. A method for securing and recharging of funds to a postage meter comprising the steps of:

(a) providing a user-identifying signal for enabling access to a meter-funds recharging program in a postage meter;

(b) inputting an identifying signal to the postage meter; and

(c) comparing said identifying signal with said user-identifying signal and if there is a match, enabling the meter funds recharging program.

12. A method according to claim 11 and further comprising the steps of:

(a) initiating communication to a control centre for recharging funds said communication providing meter information, including the number for reestablishing communication with the postage meter;

(b) breaking the communications; and

(c) initiating communication from the control centre to the postage meter in order to enable a funds transfer.

13. A postage metering system substantially as hereinbefore described with reference to and as illustrated in, any of the accompanying drawings.

14. A method of providing security for the operation of a postage meter substantially as hereinbefore described with reference to, and as illustrated in, any of the accompanying drawings.

15. A method for securing the recharging of funds to a postage meter substantially as

hereinbefore described with reference to, and as illustrated in, any of the accompanying drawings.

16. Any and all novel features of the system described herein.

Printed for Her Majesty's Stationery Office
by Burgess & Son (Abingdon) Ltd, Dd 8817356, 1987.
Published at The Patent Office, 25 Southampton Buildings,
London, WC2A 1AY, from which copies may be obtained.